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ABSTRACT

Two years of evaluation studies by the Maryland Education Technology Network (METN) are summarized in this report, which analyzes the effectiveness of school-based technology centers. During the first year of evaluation (1987), four questionnaires were administered at seven pilot schools to students, center coordinators, computer using teachers, and non-computer using teachers; during the second year (1988), questionnaires were administered at nine other schools to students and teachers. The purpose of the study was to: (1) determine the adequacy of the technical implementation of the system; (2) assess attitudes of students toward using computers as learning tools; and (3) assess teachers' attitudes toward computers as an educational tool and their perception of the effectiveness of computerized versus traditional methods of instruction. Responses to the questionnaires indicate that students' attitudes toward computer assisted instruction (CAI) were very positive, and that they preferred learning in a computerized instructional environment to learning in traditional instructional settings. Teachers were also very positive in their appraisal of CAI, and over half of the teachers felt that learning in regular school subjects by average students had increased. Tables, figures, and charts displaying the results of the surveys and copies of the questionnaires make up a large part of the report. (SD)

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MARYLAND'S STATEWIDE EDUCATIONAL TECHNOLOGY NETWORK

DESCRIPTION & EVALUATION

SAEED SALEHI
PAT MULLINIX
JEAN WODE
NATALIE DREIGHTON

A paper presented at the annual meeting of
The American Educational Research Association

San Francisco, CA March 1989

MSDE

Maryland State Department of Education
Baltimore, Maryland
March 1989

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MARYLAND'S STATEWIDE EDUCATION TECHNOLOGY NETWORK

A Summary

In recent years the state of Maryland has pioneered an innovative program in the use of educational technology in schools. Starting in 1986-87 with seven school-based learning technology centers, Maryland now has over 200 such centers and is expected to increase this number to 500 by 1989-90. In each of these centers approximately 30 personal computers are connected to a central monitoring computer in a network configuration. This sophisticated and complex project called Maryland Education Technology Network (METN), is operated by MSDE's Division of Instructional Technology. An important characteristic of this project is its self-monitoring and continuous evaluation component.

Results of two years of evaluation studies of the METN operation are reported in this paper "Maryland's Statewide Educational Technology Network: Description & Evaluation" by Saeed Salehi, Patricia Mullinix, Jean Wode and Natalie Dreighton. The report analyzes the adequacy and effectiveness of the technical implementation of each system as evaluated by teachers and center coordinators. It also describes students' reactions to computer technology as learning and instructional tools. A short report describing the daily operation of one of these centers at the Queen Anne's County High School is also attached.

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I. Introduction and Background Notes

The Maryland Education Technology Network (METN) is a unique, collaborative instructional support project. It was initiated by the Maryland State Department of Education (MSDE) and developed with the cooperation of a number of local education agencies (LEAs) throughout Maryland. METN's initial objectives were threefold. It was designed to lead the way to the development of computerized instruction in a network configuration. Local systems had mostly structured their development of learning technologies around stand-alone personal computers (PC's) and often lacked the facilities, adequate funding or trained staff to experiment and carefully develop an effective networking system. MSDE could provide the necessary resources and, with the LEA's cooperation, organize computer centers within the schools and help train teachers and staff to operate and use these centers. Secondly, METN was designed to promote MSDE's goal of achieving equity in educational opportunities for Maryland students. While it is generally acknowledged that some of Maryland's local educational programs are among the best in the United States, the funding for these programs is dependent on local budgets and ultimately on the county's wealth. Local wealth varies greatly, from one suburban county that is ranked among the richest in the nation to much poorer, sparsely populated, agrarian counties. The implementation of METN would bring about an equitable distribution of computer technology and provide access to educational support and enhancement systems for schools that lacked these resources. Thirdly, MSDE's long range plans called for the development of long distance transmission of data, information and instructional software from a central resource library to school centers throughout the State. The achievement of this objective would open the door to a vast array of potentialities for expanding students' horizons of educational experience.

Since its inception at the beginning of the school year 1986-87, the program has made great strides toward the achievement of the first two goals. In less than three years more than 200 centers have become fully equipped and operational. Almost all of these centers are founded so as to satisfy METN's objective of equity of the educational opportunity. Moreover, for the past two years each center's technical implementation and operational effectiveness has been carefully evaluated. After the first year of operation, using four separate questionnaires, students, teachers (both those who used the center

and those who did not) and center coordinators from the seven pilot schools were asked to evaluate various aspects of the center's operation. Responses to these questionnaires were analyzed and based on these results, the centers' operations were modified or improved. After the second year of operation, students and teachers of nine new schools were asked to respond to the same questionnaires. This paper combines the results of two years of evaluation and analysis of the METN program.

II. Computer Centers: Physical & Organizational Description

Most of these centers are physically located in a large centralized area with adequate space for the placement of at least 32 desks or tables providing 32 locations. Each desk supports a personal computer. A file server is installed on a separate desk, and the center coordinator/teacher has a workstation. Although the 30-station central computer classroom is common, it is not the only configuration used by METN sites. Many labs have fewer than 30 workstations, and some schools have chosen to distribute a small number of workstations to many classrooms within the building.

Whether in one room or more than one, workstations are connected in a network configuration. (see Figures 1 and 2) They run from a file server using appropriate cabling and networking software. The hardware and software network configuration may be from any of the major computer companies. METN networks include IBM/Novell, Unisys/Icon, Apple/Appleshare, Corvus or Digicard, and Tandy/3COM configurations. Programs such as IBM'S ICLAS and Tandy's SchoolMate are used to manage network software. IBM hardware and its appropriate networking software are prevalent because IBM donated a sizable quantity of equipment to a number of centers through a large educational grant. As shown in Figures 1 and 2, larger extended networks can be formed with the use of additional file servers. Other technologically advanced instructional equipment such as CD-ROM or interactive videodisc may be connected to the network.

III. Purpose of the Study

Since the beginning of the METN operation it was decided that periodically the functional effectiveness of these centers and the need for improvement and modification of the operation should be studied. This paper is based on the results of an evaluation of the technical implementation of

Networking—support for the classroom and the school

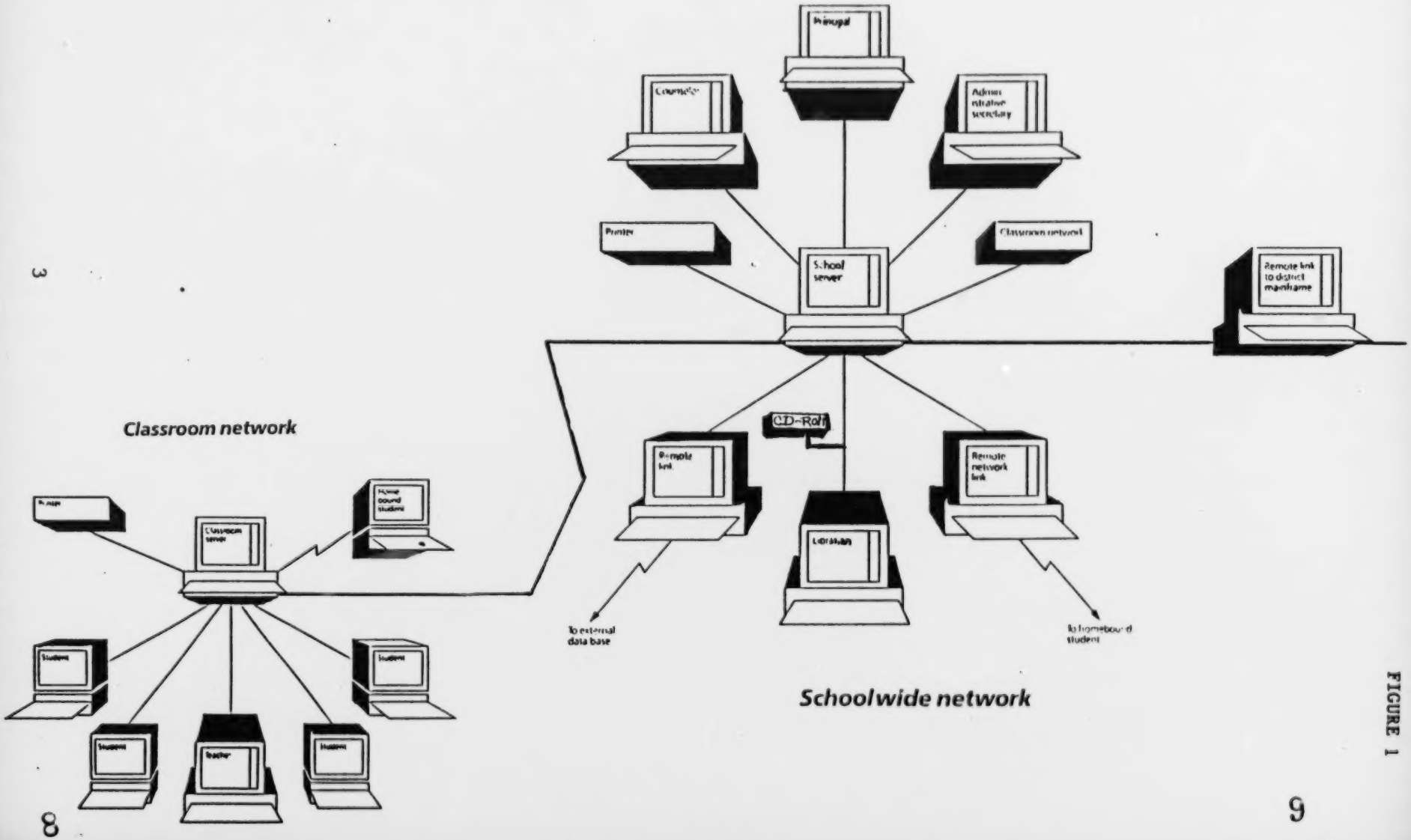
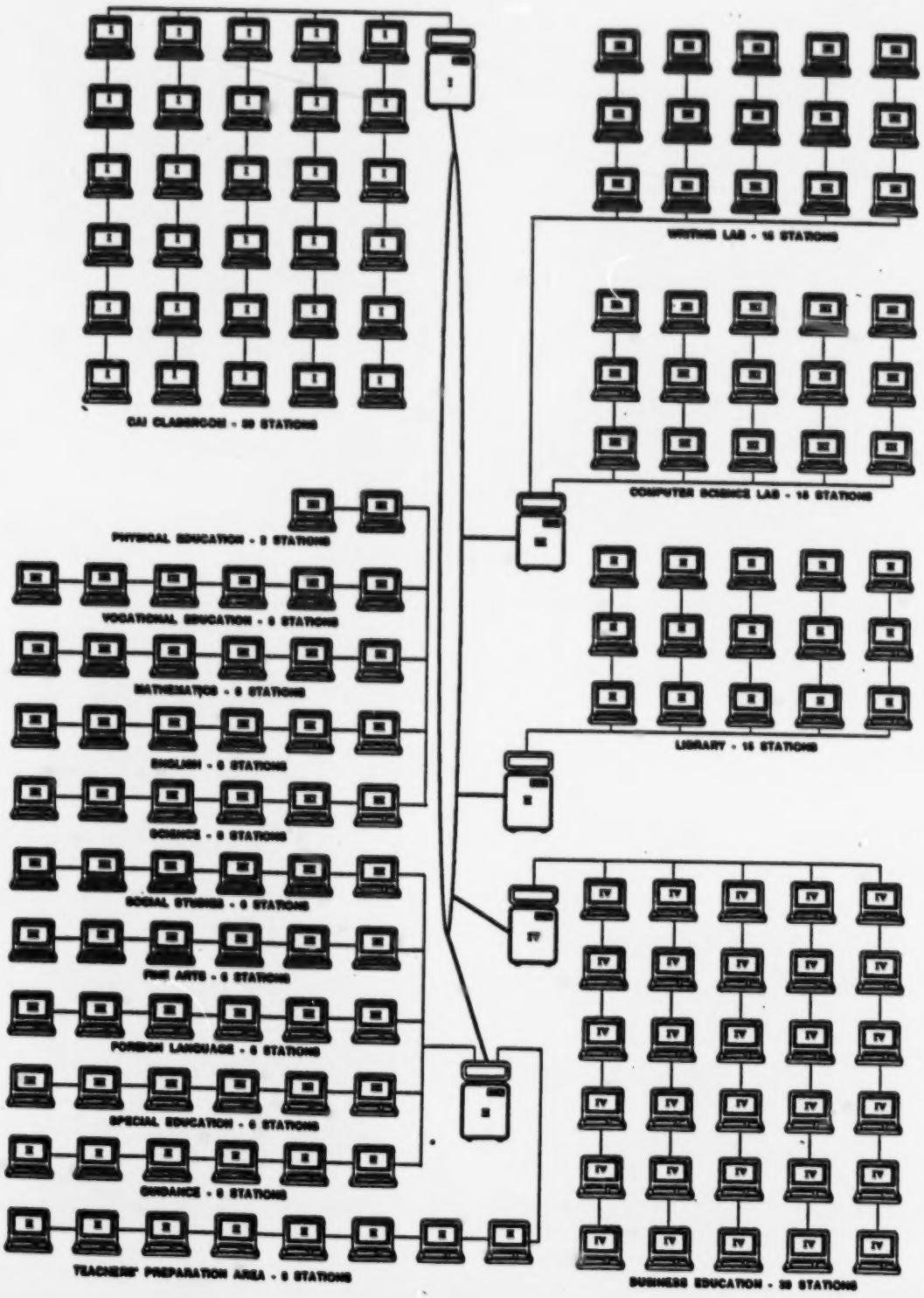


FIGURE 1

FIGURE 2

SOUTHERN HIGH SCHOOL

INSTRUCTIONAL COMPUTER PLAN


CAI CLASSROOM - 30 STATIONS
WRITING LAB - 16 STATIONS
COMPUTER SCIENCE LAB - 16 STATIONS
LIBRARY - 16 STATIONS
BUSINESS EDUCATION - 30 STATIONS
PHYSICAL EDUCATION - 2 STATIONS
VOCATIONAL EDUCATION - 6 STATIONS
MATHEMATICS - 6 STATIONS
ENGLISH - 6 STATIONS
SCIENCE - 6 STATIONS
SOCIAL STUDIES - 6 STATIONS
FINE ARTS - 6 STATIONS
FOREIGN LANGUAGE - 6 STATIONS
SPECIAL EDUCATION - 6 STATIONS
GUIDANCE - 6 STATIONS
TEACHERS' PREPARATION AREA - 8 STATIONS

METN centers for each of two consecutive years of these centers' operations. In the first year's study, four different questionnaires were given to students, center coordinators and teachers (both those who used the centers and worked with computers and those who didn't.) At the end of the second year of operation, a different group of schools were chosen to respond to the questionnaires and this time only students and computer using teachers were asked to respond. The purpose of the study was to do the following:

1. Determine the adequacy and effectiveness of the technical implementation of the system.

2. Assess attitudes of students toward using computers as learning tools. Students' responses were further analyzed by school level (elementary, middle, and high) and by sex.

3. Assess teachers' attitudes toward computers as an educational tool and their perception of the effectiveness of the computerized vs. traditional methods of instruction.

IV. Methodology

As mentioned earlier, at the end of the first year of METN operation, four separate survey instruments were developed and disseminated to students, computer using teachers, non-computer using teachers and site coordinators from seven different centers. These centers were located in two elementary, three middle and two high schools. After the second year of operation, questionnaires were given to students and computer using teachers from nine new schools. In all, responses were collected from 2,125 students after the first year and 1,725 students after the second year. Responses were also collected from 139 computer using teachers the first year and 68 teachers the second year. Eleven site coordinators and 118 non-computer using teachers responded to the questionnaires. Comparison of responses of the two entirely different groups of students and teachers indicated a remarkably similar answering pattern and a very high degree of reliability of responses on quasi-repeated measure analysis.

The students' questionnaire consisted of 16 items and was designed to assess students' attitude toward computerized instruction specifically within the networking environment. Computer using teachers' questionnaires treated

topics such as their experience with the reliability and technical effectiveness of the center's operation, staff training needs and teachers' evaluation of the centers as instructional tools in comparison with traditional procedures. Adequacy and appropriateness of instructional software were also evaluated. Non-computer using teachers were asked to evaluate the centers' effectiveness and provide clues as to why they were not using the centers. Site coordinators were asked to evaluate the centers' operational effectiveness and identify both weaknesses and strengths of each site and suggest ways of improving the operation. All three staff questionnaires shared a number of identical questions and contained approximately 70 items. (see Appendix C) Table I, below, shows a breakdown of responses by the year and school level.

Table I - Number of Respondents in Each Academic Year by School Level

	1986-87				1987-88			
Respondents	Elementary	Middle	High	Total	Elementary	Middle	High	Total
Students	401	948	776	2125	516	964	245	1725
Computer Using Teachers	33	46	60	139	11	40	17	68
Non-Computer Teachers	13	59	46	118	NA	NA	NA	NA
Site Coordinators	2	5	4	11	NA	NA	NA	NA

V. Findings

As was stated earlier, comparative analysis of the two surveys indicates that both students' and teachers' responses were highly reliable. Survey results are reported here in relation to the three objectives of the study.

A. **Students' attitudes toward computers as learning tools.** Analysis of responses indicate that students were very positive about computerized instruction in general and their experiences in the network environment in particular. Table II and Charts 1 to 4 illustrate their responses to each of the 16 questions. These show that the majority of students prefer learning in a computerized instructional environment to traditional instructional settings. (see Table II) Close to 80% felt that computer assisted instruction (CAI) was useful in learning math and a larger percentage in both groups (first and second year respondents) wanted to study more subjects this way. While approximately 70% of them felt they did not get enough time with the computers, close to 84% agreed that learning with computers is fun, and a large majority agreed that it made learning easier. Taking a test was not as difficult on a computer network system. Students also liked the privacy it offered in masking their mistakes from public scrutiny, and many felt the system operated like their own private teacher. When students' answers were factor analyzed, four factors emerged as follows:

1. **Experience of discomfort and anxiety in working with computers.** This factor was based on the following items:

   Item 9 - I am afraid of working with computers.

   Item 15 - Writing with a computer is more difficult than using paper and pencil.

   Item 3 - I spend more time trying to figure out which button to press on the computer than learning the material.

   Item 5 - I feel uncomfortable when I am taking a test on the computer. (If applicable)

   Item 11 - I get bored working by myself at the computer.

TABLE II

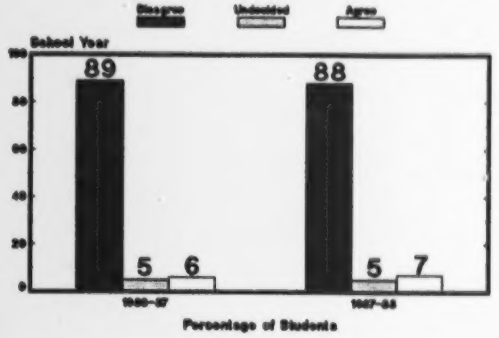
METN

	RESULTS	1988	1987
Q1	"USEFUL FOR LEARNING MATH"		
	AGREE	78.1%	76.5%
Q2	"TEACHER RATHER THAN COMPUTER"		
	DISAGREE	56.9%	50.5%
Q3	"FIGURING OUT WHICH BUTTON"		
	DISAGREE	70.3%	65.7%
Q4	"FEEL LIKE OWN PRIVATE TEACHER"		
	AGREE	65.0%	66.0%
Q5	"TAKING A TEST UNCOMFORTABLE"		
	DISAGREE	53.0%	49.8%
Q6	"MAKE IT EASIER TO LEARN"		
	AGREE	60.2%	57.0%
Q7	"CLASSROOM INSTEAD OF COMPUTER LAB"		
	DISAGREE	64.4%	60.3%
Q8	"USEFUL FOR LEARNING SOCIAL STUDIES"		
	AGREE	32.4%	50.0%

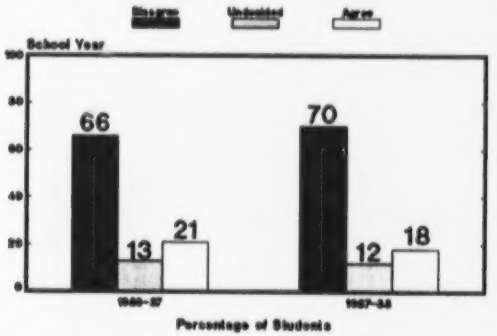
Q9		"FEAR OF COMPUTERS"	
	DISAGREE	88.1%	89.2%
Q10		"LIKE TO KNOW HOW OTHERS ARE DOING"	
	AGREE	43.9%	41.7%
Q11		"GET BORED WORKING BY MYSELF"	
	DISAGREE	62.2%	64.3%
Q12		"LIKE NO ONE SEEING MY MISTAKES"	
	AGREE	49.3%	48.0%
Q13		"LEARNING WITH COMPUTERS IS FUN"	
	AGREE	83.8%	83.6%
Q14		"DO NOT GET ENOUGH TIME"	
	AGREE	66.9%	68.1%
Q15		"WRITING IS MORE DIFFICULT"	
	DISAGREE	59.3%	60.6%
Q16		"LIKE TO USE FOR MORE CLASSES"	
	AGREE	81.7%	79.2%

UNCOMFORTABLE WORKING WITH COMPUTERS

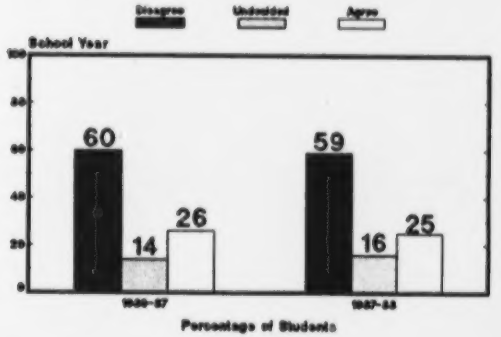
I am afraid of working with computers.



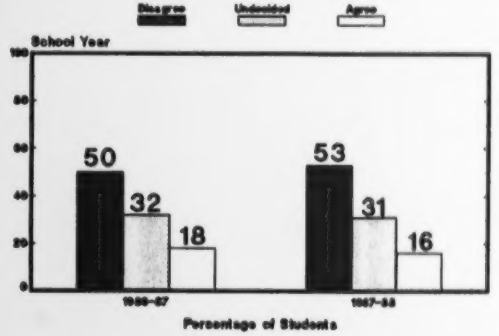
I spend more time trying to figure out which button to press.



Writing with a computer is more difficult than using paper and pencil.



I feel uncomfortable when I am taking a test on the computer.



I get bored working by myself at the computer.

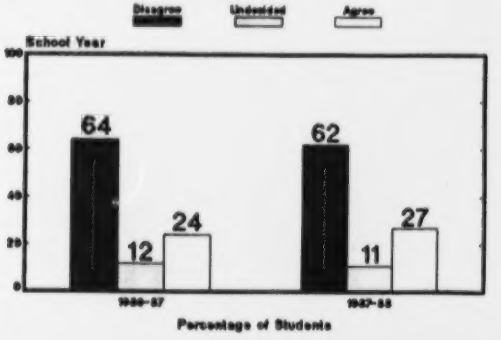


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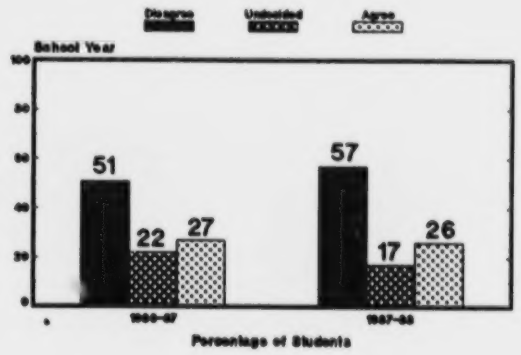
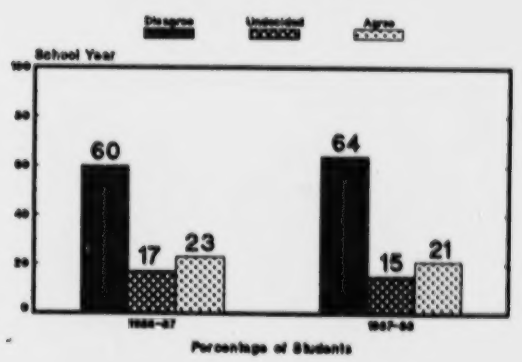
CHART 1

PREFERENCE FOR TRADITIONAL VS COMPUTERIZED LEARNING

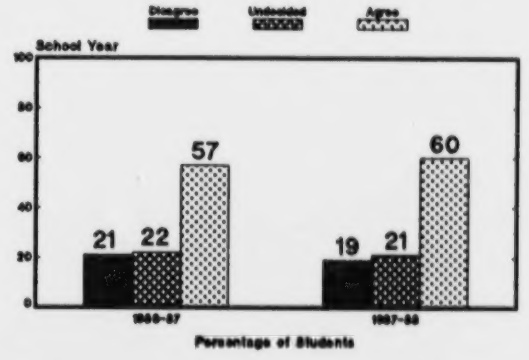
I would rather be taught by a teacher than work on the computer.



I would rather be in a regular classroom instead of a computer lab.



Computers make it easier for me to learn.



I feel like I have my own private teacher when I am using the computer.

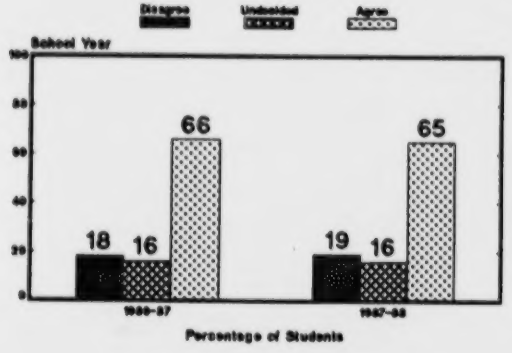


CHART 2

Only 6% of students indicated they felt uncomfortable or anxious working with the computers. Approximately 20% were neutral and 74% were enthusiastic and positive about studying with computers. Elementary students were more positive and comfortable than high school students and girls were slightly more enthusiastic than boys.

2. **Traditional versus computerized instruction.** The majority of students (62%) endorsed CAI over the traditional approach with 28% indicating their indifference and only 10% expressing preference for the traditional instruction. Once again an interaction between the school level and degree of preference for the CAI was observed. Only 8% of elementary students wanted the traditional approach. The percentage was considerably greater for high school students (16%). Items loading on this factor were the following:

   Item 2 - I would rather be taught by a teacher than work on the computer.

   Item 7 - I would rather be in a regular classroom where everyone works on the same material at the same time instead of a computer lab.

   Item 6 - Computers make it easier for me to learn.

   Item 4 - I feel like I have my own private teacher when I am using the computer.

3. **Enjoy working with computers.**

   This factor consisted of the followings items:

   Item 14 - I don't get enough time on the computer.

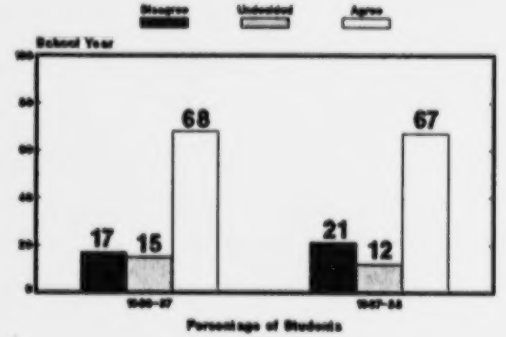
   Item 12 - I like working on the computer because no one can see my mistakes.

   Item 16 - I would like to use computers for more of my classes.

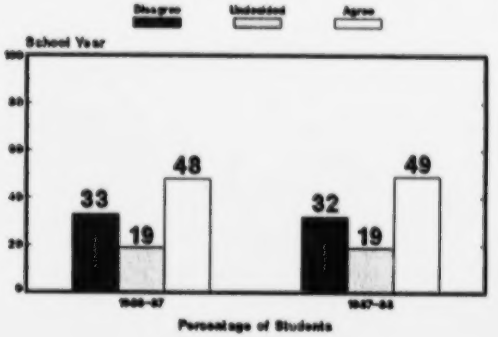
   Item 13 - Learning with computers is fun.

ENJOYS WORKING WITH COMPUTERS

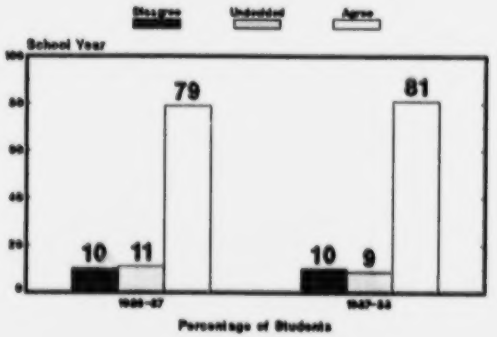
I don't get enough tiime on the computer.



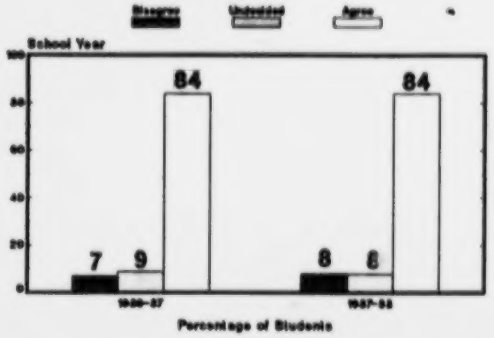
I like working on the computer because no one can see my mistakes.



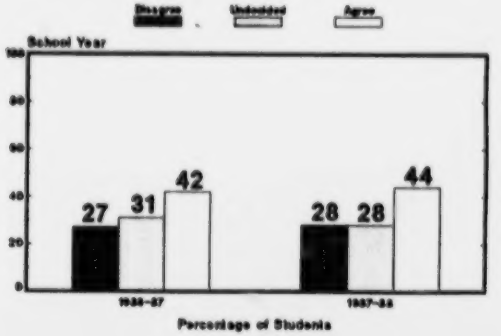
I would like to use computers for more of my classes.



Learning with computers is fun.

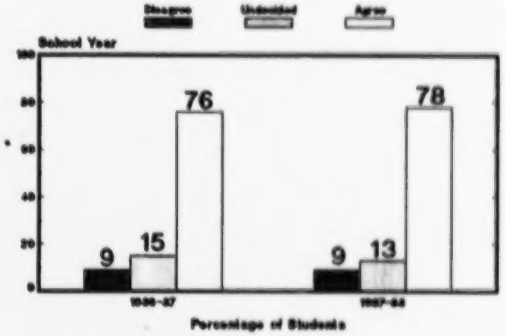


I would like to know how the other students using computers are doing.

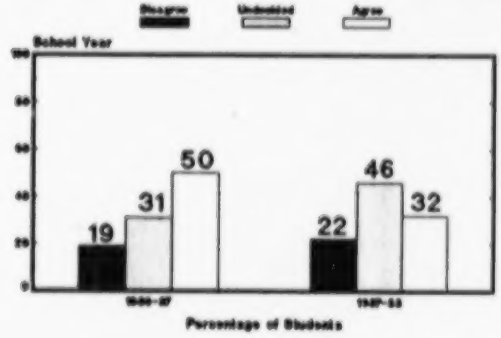


USEFUL FOR LEARNING MATH AND SOCIAL STUDIES

Computers are useful for learning math.



Computers are useful for learning social studies.



23

24

Item 10 - I would like to know how the other students using computers are doing.

These items were naturally related to how enjoyable CAI was for students. They were asked whether learning with the aid of computers enhanced their sense of efficacy, or if they enjoyed the privacy of testing and the sharing of knowledge with fellow students within the same class session. The over all response to these questions was resoundingly positive and indicated that students wanted more computerized classes.

4. **Computers are useful for learning mathematics and social studies.** Items 1 and 8 comprise this fourth factor and answers to both questions for the majority of students were YES. The number of students who answered positively to the first question was considerably greater than those who said YES to the item #8.

We can sum up the students' results by noting that as measured by the level of student response, the METN program has been very successful. Students in general enjoy studying with computers, are not bored and like to study most of their courses in the CAI networking environment.

B. What are attitudes of teachers toward computers as an educational tool and their perception of the effectiveness of the CAI versus traditional methods of instruction?

Computer using teachers were very positive in their appraisal of CAI with network facilities. Table III provides results of teacher surveys in 1986-87 and 1987-88 for the 60 items in the questionnaire. In response to the question of the value of the METN system, 92% of teachers in the 1987-88 survey felt that the system has been very valuable as an instructional tool.

Teachers in either of the two surveys stated that as a consequence of working in the computer center students appeared to be more enthusiastic about school in general and studying computer assisted subjects in particular. They observed other positive side effects to the use of computer centers. Slightly over 70% of teachers reported that the number of students working on their own without direct supervision from the teacher had increased. Most teachers observed increased learning opportunities for handicapped (over 68%) or academically gifted (close to 74%). According to 53% of all teachers,

TABLE III

COMPUTER USING TEACHER SURVEY - METN

1. The METN computer system has been effective in providing instruction support.

% SURVEY	strongly disagree	disagree	undecided	agree	strongly agree
1988		2.9	11.8	38.2	47.1
1987	4.3	3.6	7.9	39.6	44.6

2. The computer system has been effective in providing planning resources for teachers and administrators.

%	strongly disagree	disagree	undecided	agree	strongly agree
1988	2.9	2.9	27.9	38.2	27.9
1987	4.4	5.8	22.6	43.1	24.1

3. Operationally, the computer system has been reliable.

%	strongly disagree	disagree	undecided	agree	strongly agree
1988	4.4	2.9	14.7	50.0	27.9
1987	2.2	9.5	6.6	61.3	20.4

4. The technical support given to the computer system is adequate.

%	strongly disagree	disagree	undecided	agree	strongly agree
1988	2.9	1.5	26.5	44.1	25.0
1987	3.0	7.4	14.8	54.1	20.7

5. The METN computer system is superior to other computers available for classroom use.

%	strongly disagree	disagree	undecided	agree	strongly agree
1988	5.9	10.3	47.1	22.1	14.7
1987	6.0	5.2	41.8	25.4	21.6

6. The computer system's storage space is adequate for our instructional needs.

%	strongly disagree	disagree	undecided	agree	strongly agree
1988		8.8	32.4	36.8	22.1
1987	5.1	12.4	26.4	40.9	21.2

7. Additional training sessions should be provided for teachers.

%	strongly disagree	disagree	undecided	agree	strongly agree
1988	1.5	7.4	8.8	44.1	38.2

8. The resources/materials used in training programs were satisfactory.

%	strongly disagree	disagree	undecided	agree	strongly agree
1988	1.5	13.4	23.9	53.7	7.5
1987	2.2	5.8	14.6	62.8	14.6

9. At our school the METN computer facilities are being used less than what would have been expected a year ago.

%	strongly disagree	disagree	undecided	agree	strongly agree
1988	47.0	31.8	13.6	4.5	1.5
1987	38.7	38.0	11.7	7.3	4.4

10. Our school has too few computers for students to have sufficient time to learn.

%	strongly disagree	disagree	undecided	agree	strongly agree
1988	16.4	29.9	7.5	29.9	16.4
1987	10.1	36.7	13.7	20.9	18.7

11. We can't afford the cost of software that would adequately serve our needs

%	strongly disagree	disagree	undecided	agree	strongly agree
1988	7.5	19.4	49.3	17.9	6.0
1987	9.5	35.0	34.3	17.5	3.6

12. There are better ways to provide instruction than with the use of computers.

%	strongly disagree	disagree	undecided	agree	strongly agree
1988	17.9	31.3	25.4	23.9	1.5
1987	16.9	40.4	26.5	14.0	2.2

13. The amount of software available on the METN system is adequate.

%	strongly disagree	disagree	undecided	agree	strongly agree
1988	10.3	30.9	30.9	25.0	2.9
1987	11.6	26.8	27.5	30.4	3.6

14. The content of the software available on the METN system is appropriate.

%	strongly disagree	disagree	undecided	agree	strongly agree
1988	1.5	13.2	35.3	47.1	2.9
1987	5.1	14.5	18.1	52.9	9.4

15. Using the METN system has been valuable to the participating teachers as an instructional tool.

%	strongly disagree	disagree	undecided	agree	strongly agree
1988		2.9	4.4	52.9	39.7
1987	2.9	5.0	10.8	49.6	31.7

16. Using the METN system has been valuable to the participating teachers as an administrative tool.

%	strongly disagree	disagree	undecided	agree	strongly agree
1988	2.9	5.9	39.7	38.2	13.2
1987	8.2	12.7	36.6	28.4	14.2

17. Only the more able students can benefit from a networking system.

%	strongly disagree	disagree	undecided	agree	strongly agree
1988	62.7	26.9	9.0	1.5	
1987	33.6	35.0	21.2	6.6	3.6

18. Use of a networking system as an instructional tool will alter the teaching style of many teachers.

%	strongly disagree	disagree	undecided	agree	strongly agree
1988	8.8	22.1	27.9	39.7	1.5
1987	2.9	22.3	28.1	28.8	18.0

19. In general, as long as students have access to computers, it doesn't matter if it is with a networking system or stand-alone computer.

%	strongly disagree	disagree	undecided	agree	strongly agree
1988	15.2	45.5	15.2	18.2	6.1
1987	10.8	22.3	28.1	28.1	10.8

20. It is best if teachers have all their students at the computers working on the same lesson at the same time.

%	strongly disagree	disagree	undecided	agree	strongly agree
1988	18.2	42.4	15.2	22.7	1.5
1987	6.5	43.5	17.4	20.3	12.3

21. In our school, students usually use the same software packages at the same time.

%	strongly disagree	disagree	undecided	agree	strongly agree
1988	4.4	11.8	26.5	50.0	7.4

22. Students with computers and printers at home have an unfair advantage over other students.

%	strongly disagree	disagree	undecided	agree	strongly agree
1988	13.4	44.8	25.4	13.4	3.0

23. Students/Staff use the wordprocessor to write articles/research papers.

%	never	rarely	sometimes	most of the time	always
1988	10.6	12.1	30.3	28.8	18.2
1987	29.6	12.6	28.9	35.9	3.0

24. Students/Staff use the wordprocessor to make class products like a book/newspaper.

%	never	rarely	sometimes	most of the time	always
1988	33.3	18.2	27.3	9.1	12.1
1987	56.0	15.7	15.7	8.2	4.5

25. Students/Staff use the wordprocessor for planning/administrative use.

%	never	rarely	sometimes	most of the time	always
1988	22.7	19.7	31.8	13.6	12.1
1987	40.4	11.0	26.5	17.6	4.4

26. Students/Staff use the wordprocessor for preparation of instructional materials.

%	never	rarely	sometimes	most of the time	always
1988	25.8	15.2	36.4	16.7	6.1
1987	25.7	11.0	35.3	22.8	5.1

27. Drills to help students practice vocabulary or skills.

%	never	rarely	sometimes	most of the time	always
1988	18.2	19.7	37.9	16.7	7.6

28. Games to help students practice words, skills, or concepts.

%	never	rarely	sometimes	most of the time	always
1988	12.1	19.7	48.5	15.2	4.5

29. Programs that explain(tutor) concepts or methods.

%	never	rarely	sometimes	most of the time	always
1988	13.6	22.7	40.9	18.2	4.5

30. Simulations for learning or using concepts and skills in a situation.

%	never	rarely	sometimes	most of the time	always
1988	19.7	21.2	33.3	22.7	3.0

31. Programs that give students problem-solving tasks or discovery learning ativities.

%	never	rarely	sometimes	most of the time	always
1988	12.1	16.7	42.4	24.2	4.5

32. Programs that let students make pictures, graphics, and music.

%	never	rarely	sometimes	most of the time	always
1988	2...	36.9	15.4	10.8	6.2

33. Programs that do calculations or help solve math problems.

%	never	rarely	sometimes	most of the time	always
1988	31.8	22.7	18.2	15.2	10.6

34. Word-Processing software or programs that help with writing.

%	never	rarely	sometimes	most of the time	always
1988	12.1	12.1	16.7	33.3	25.8

35. A programming language, like BASIC, for students to write their own programs.

%	never	rarely	sometimes	most of the time	always
1988	62.1	13.6	12.1	4.5	4.5

36. Programs that provide database searching and research assistance. learning ativities.

%	never	rarely	sometimes	most of the time	always
1988	53.0	10.6	13.6	15.2	4.5

37. What would you estimate is the average response time to load instructional materials?

%	< 1	1-3 min	4-6 mins	7-10 mins	> 10 mins
1988	20.0	35.4	24.6	13.8	6.2
1987	6.9	43.5	29.8	9.9	9.9

38. In the past school year, how many times have you experienced equipment failure?

%	0-5	6-10	11-15	16-20	> 20
1988	71.2	12.1	10.6	3.0	3.0
1987	70.3	16.7	5.8	2.2	5.1

39. On the average, how much time expired before equipment failure problems were resolved?

%	minutes	hours	days	weeks	months
1988	50.8	24.6	14.8	6.6	3.3
1987	36.5	27.0	26.2	6.3	4.0

40. What has been the format of your training?

%	lecture 7<	lecture 8>	hands on 7<	hands on 8>	tutoring
1988	3.0	7.5	44.8	32.8	10.4
1987	6.5	6.5	27.4	48.4	11.3

41. How much time per semester have you spent in formal trainining?

%	< 1 day	1-5 days	6-10 days	11-15 days	> 15 days
1988	50.0	42.6		2.9	2.9

42. For how many minutes on the average does any one student usually use a given computer program at any one session?

%	10 mins	20 mins	30 mins	40 mins	50+ mins
1988		10.4	23.9	61.2	3.0

43. When was the most recent occasion that some students in your class did computer work during class time?

%	3 days	3 dys-2 wk	2 wks-3 wks	> 3 weeks	never
1988	36.4	24.2	7.6	31.8	

44. Which of the rules for apportioning time do you think is <u>most commonly used by teachers</u> at the school?

%	equal time	> time for slower	> for work completed	> for do not own PC	> for interested
1988	86.6	1.5	4.5		7.5
1987	77.4	6.0	9.8		6.8

45. How many students work at any one computer at one time?

%	one student	one plus tutoring	one with watching	pair	more than two
1988	76.1		4.5	17.9	1.5
1987	77.0	2.2	7.4	11.9	1.5

46. Which of the methods for apportioning time do you think is best not use at your school?

%	equal time	> time for slower	> for work completed	> for do not own PC	> for interested
1988	82.1	9.0		1.5	7.5
1987	85.2	8.1	2.2	.7	3.7

47. Introducing students to the subject.

%	computer	traditional	same
1988	13.4	68.7	17.9
1987	16.3	62.2	21.5

48. Providing a large variety of examples to illustrate and/or clarify concepts.

%	computer	traditional	same
1988	55.2	25.4	16.4
1987	63.7	20.7	15.6

49. Covering the material rapidly.

%	computer	traditional	same
1988	51.5	21.2	21.2
1987	52.9	28.7	18.4

50. Teaching to students of different abilities.

%	computer	traditional	same
1988	50.7	16.4	26.9
1987	66.2	17.6	16.2

51. Providing remedial assistance.

%	computer	traditional	same
1988	62.1	13.6	18.2
1987	69.4	16.4	14.2

52. The apparent level of enthusiasm of computer-using students for school in general has.

%	decreased	unchange	increased
1988	1.5	18.2	80.3
1987	2.9	16.9	80.1

35

53. Special opportunities for students with learning disabilities or handicaps have.

%	decreased	unchange	increased
1988		41.5	58.5
1987	4.6	22.3	73.1

54. Special opportunities for the academically gifted have.

%	decreased	unchange	increased
1988		37.9	62.1
1987		20.8	79.2

55. Learning in regular school subjects by average students has.

%	decreased	unchange	increased
1988		54.5	45.5
1987		43.3	56.7

56. Learning in regular school subjects by below-average students has.

%	decreased	unchange	increased
1988		46.3	53.7
1987	.8	34.1	65.2

57. Students working successfully on their own without direct supervision from the teacher has.

%	decreased	unchange	increased
1988	4.5	22.4	73.1
1987	2.3	30.1	67.7

58. Students taking the lead in helping other students with their questions has.

%	decreased	unchange	increased
1988	6.1	33.3	60.6
1987	7.0	46.5	46.5

59. Students being given assignments specifically tailored to their prior performance has.

%	decreased	unchange	increased
1988	3.1	55.4	41.5
1987	10.2	43.0	46.9

60. Diagnoses of students' learning problems and misunderstandings have.

%	decreased	unchange	increased
1988	4.6	69.2	24.6
1987	9.4	51.6	39.1

learning in regular school subjects by average students had increase. More than 61% of all teachers stated that this increase had been true for below average students. It was not surprising, therefore, when 90% of 1987-88 group of teachers disagreed with the statement of "only the more able students can benefit from a networking system." One teacher said, "Students who may have difficulty verbalizing can feel better about themselves after mastering a particular area on the computer system."

An important point cited by the majority of 1988 teachers was that "students were taking the lead in helping other students with their questions." Approximately 44% of all teachers stated that CAI had increased their potential for giving assignments specifically tailored to students' prior performance, but only 35% felt that working in the computer center had increased their capabilities for diagnosing their students' learning problems and misunderstandings.

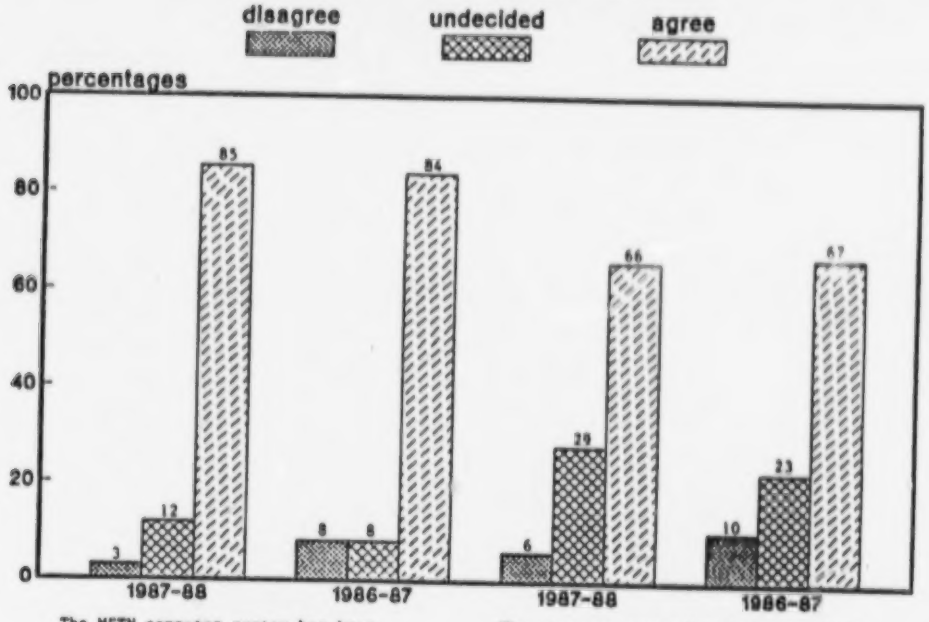
In view of the above positive observations, it is not surprising that when asked whether "the METN computer system has been effective in providing instructional support" each year 85% of teachers agreed that it had. Almost all teachers were impressed by the networking feature of the systems. As one teacher commented, "The network truly individualizes the learning activities and also gives me freedom to help those who need it most."

C. Determine the adequacy and effectiveness of the technical implementation of the system.

Slightly better than 80% of the teachers felt that "Operationally, the computer system has been reliable." They had experienced fewer than ten equipment failures during the school year, according to 80% of all the teachers, and most of these felt that resolution of equipment problems was achieved in a reasonable length of time. Slightly better than 70% felt the technical support given to the computer system was adequate with less than 7% complaining about its inadequacy. There was, however, a larger proportion of teachers who felt the amount of software available on the METN system was inadequate (40% said it was inadequate, 30% said it was adequate, and 30% undecided). More than one half of all teachers stated that the software available was appropriate. They also complained about not having enough computers for students and not enough time at the computer center. The almost

COMPARISON OF TEACHER RESPONSES

for School Years 1986-87 & 1987-88

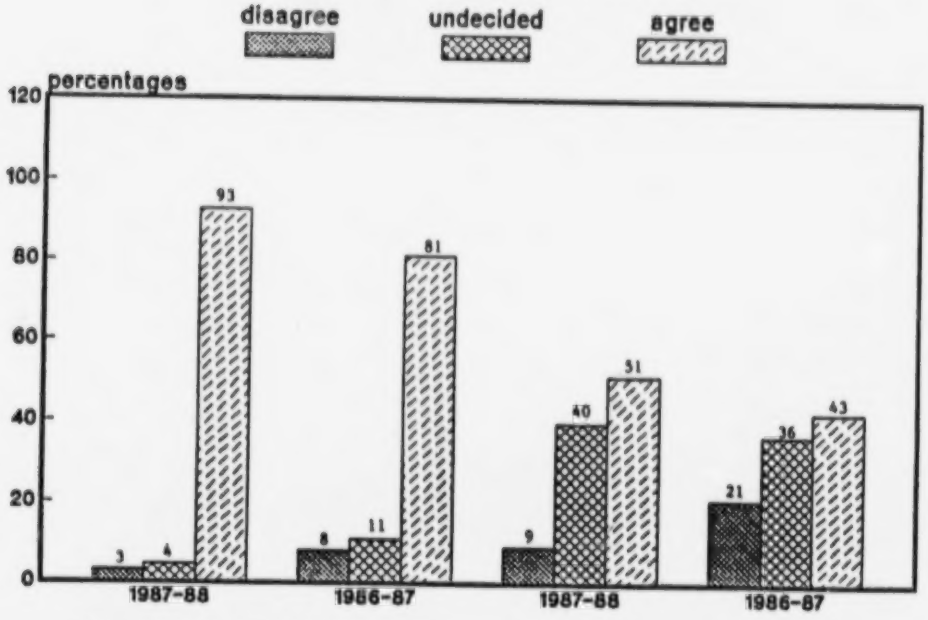


The METN computer system has been effective in providing instructional support.

The computer system has been effective in providing planning resources for teachers and administrators.

COMPARISON OF TEACHER RESPONSES

for School Years 1986-87 & 1987-88

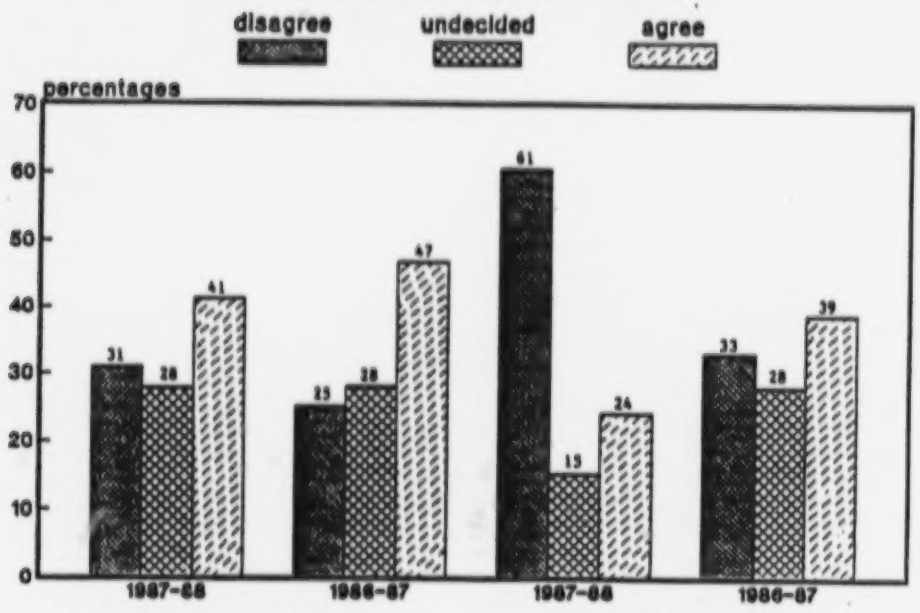


Using the METN system has been valuable to the participating teachers as an instructional tool.

Using the METN system has been valuable to the participating teachers as an administrative tool.

COMPARISON OF TEACHER RESPONSES

for School Years 1986-87 & 1987-88

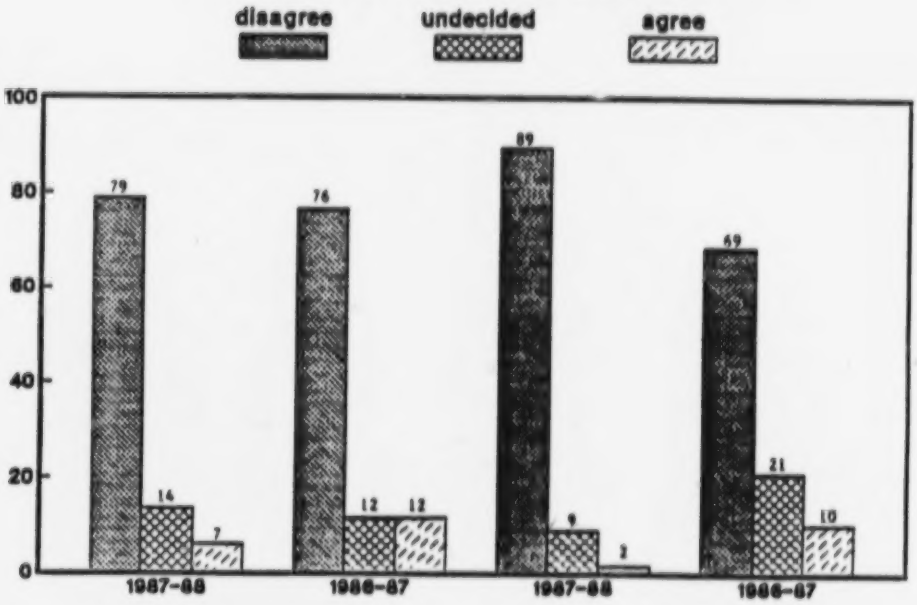


Use of a networking system as an instructional tool will alter the teaching style of many teachers.

In general, as long as students have access to computers, it doesn't matter if it is with a networking system or standalone computer.

COMPARISON OF TEACHER RESPONSES

for School Years 1986-87 & 1987-88



At our school the MSTN computer facilities are being used less than what would have been expected a year ago.

Only the more able students can benefit from a networking system.

unanimous verdict was that they liked what they saw, they were using what was available but they wanted more of it, "Much, much more".

More than 80% of the teachers wanted more training in the use of computers and the network system. In fact, adequate training and staff development topped just about everyone's wish list. The reason most often given by those teachers who did not use the system was the lack of familiarity with computers and the center's facilities. Not fully understanding how to work with a computer, they confessed being intimidated by it. One teacher wrote that he/she felt unwelcome at the computer center.

A number of teachers expressed the need for appropriate software. Understandably educational software development lags behind the hardware technology. Some teachers (mostly in social sciences, Arts and physical education) complain that there is little good software in their teaching fields. The survey showed that language arts and word processing software were the most used in the centers. (see Chart 7) Problem solving in Mathematics and physical sciences were next in the frequency of use, followed by games, database searching and graphics/music.

Most of the immediate remedial action was directed toward correcting inadequacies in this phase of the project, i.e., providing more equipment and training sessions; developing a larger quantity of appropriate software and enlarging the resource library facilities. Many of the problems cited by teachers and staff of the first year group have already been dealt with, and it is anticipated that the third year group will express relatively higher levels of satisfaction with the technical implementation of the project.

VI. Observations and Conclusions

This two-year survey/evaluation has been combined with close observation of the sites where computer network labs have been installed. Additionally many teachers and site coordinators have been interviewed at these centers. This overall effort has provided much valuable data regarding the operation of the networking centers and a good deal of information has been generated about where improvements are needed and what are some of the functional limitations of the METN program. The need for staff training development is most obvious. Teachers want to learn more about using the instructional technologies in a more effective way and expand their own capabilities in using the computer and

VARIETY OF SOFTWARE
for School Year 1987-88

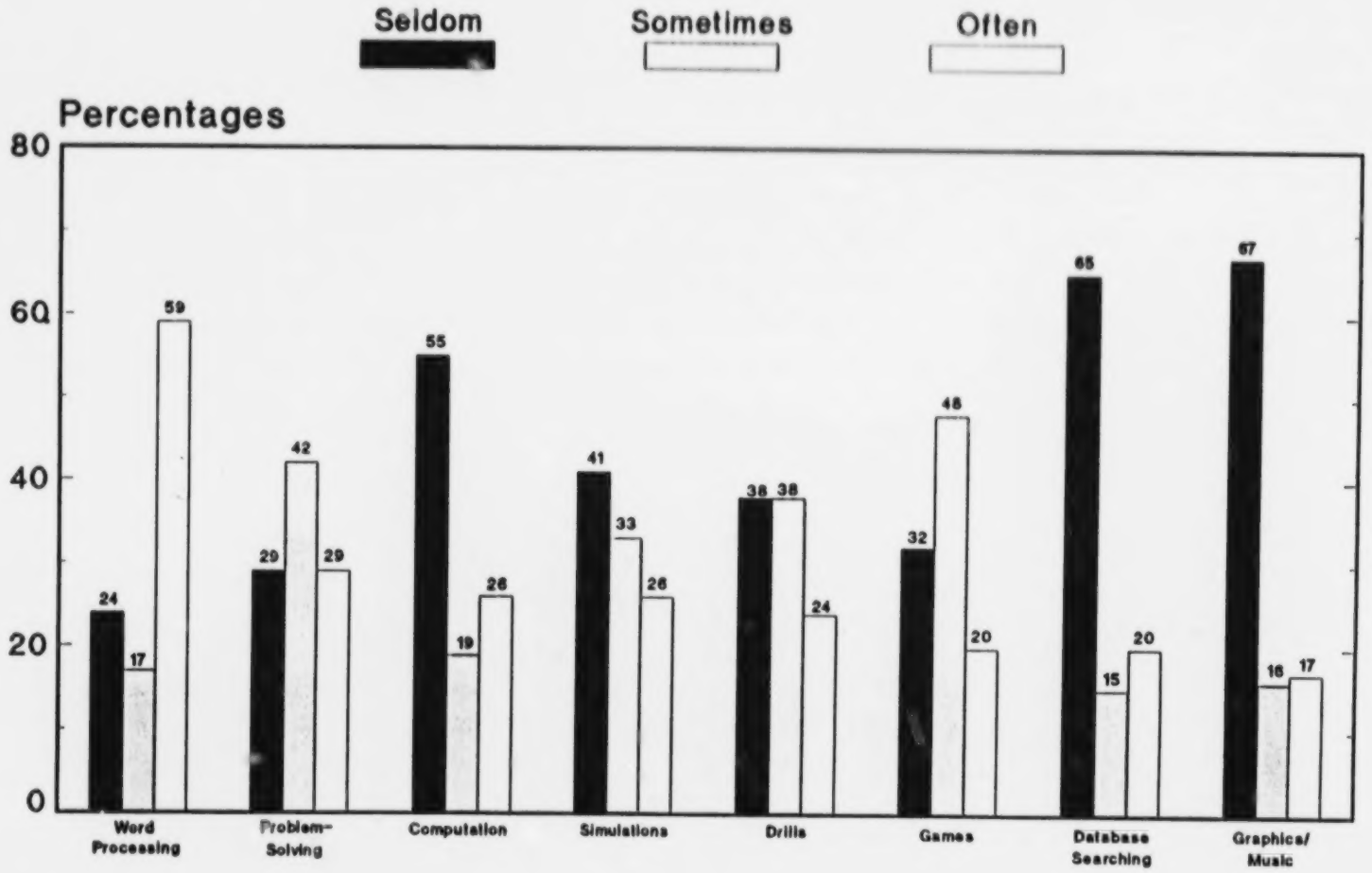


CHART 7

fully exploit its potentials. Many express the need to use computers as tools for their own writing and bookkeeping. In instances where teachers have been provided help in learning word processing, for example, the use of the computer center has greatly increased. However, even in areas where teachers have felt inadequately prepared, students' attitudes and reactions have been very positive toward their CAI experiences.

With the gradual increase in experience and knowledge, teachers and site coordinators have gained a much broader understanding of a variety of uses for the networking centers. They see the network's advantages in terms of its ease of use, and its stimulation of student's interest. They find the management systems allow them to easily individualize student programs, and have discovered that students of varied ability levels can simultaneously work together, and learn and progress at their own speed. Efforts to integrate broader use of computers into curriculum have greatly increased. In several schools the impact has been significant enough to bring forth a firm commitment by the administration to expand the computer network to the point of achieving a 10 to 1 student-to-computer ratio. It is expected that with the provision of additional computers, students will be able to regularly use computers in all subject areas.

Already the centers have proven themselves as valuable instructional tools. The next step in the process of full justification of the expenditure and allocation of resources is relating students' growth in learning and achievement to the use of the centers. This is understandably a more complex and time consuming undertaking. At this time plans for a longitudinal study of the METN program and its educational effectiveness are being completed. Now that equipment is in place and the centers are off and running, it is time to prove that they are truly effective.

STUDENT QUESTIONNAIRE - METN

Grade _____ No. of Sessions Per Week _____

Sex _____ Length of Time in Session _____

Directions: Circle the number which best tells how you feel about using the computer.	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
1. Computers are useful for learning math.	1	2	3	4	5
2. I would rather be taught by a teacher than work on the computer.	1	2	3	4	5
3. I spend more time trying to figure out which button to press on the computer than learning the material.	1	2	3	4	5
4. I feel like I have my own private teacher when I am using the computer.	1	2	3	4	5
5. I feel uncomfortable when I am taking a test on the computer. (If applicable)	1	2	3	4	5
6. Computers make it easier for me to learn.	1	2	3	4	5
7. I would rather be in a regular classroom where everyone works on the same material at the same time instead of a computer lab.	1	2	3	4	5
8. Computers are useful for learning social studies.	1	2	3	4	5
9. I am afraid of working with computers.	1	2	3	4	5
10. I would like to know how the other students using computers are doing.	1	2	3	4	5
11. I get bored working by myself at the computer.	1	2	3	4	5
12. I like working on the computer because no one can see my mistakes.	1	2	3	4	5
13. Learning with computers is fun.	1	2	3	4	5
14. I don't get enough time on the computer.	1	2	3	4	5
15. Writing with a computer is more difficult than using paper and pencil.	1	2	3	4	5
16. I would like to use computers for more of my classes.	1	2	3	4	5

METN QUESTIONNAIRE

I. Directions: Mark your answer sheet with the response (number) which best describes how you feel about using the METN computer system.	Strongly Disagree	Disagree	Undecided/ Don't Know	Agree	Strongly Agree
1. The METN computer system has been effective in providing instructional support.	1	2	3	4	5
2. The computer system has been effective in providing planning resources for teachers and administrators.	1	2	3	4	5
3. Operationally, the computer system has been reliable.	1	2	3	4	5
4. The technical support given to the computer system is adequate.	1	2	3	4	5
5. The METN computer system is superior to other computers available for classroom use.	1	2	3	4	5
6. The computer system's storage space is adequate for our instructional needs.	1	2	3	4	5
7. Additional training sessions should be provided for teachers.	1	2	3	4	5
8. The resources/materials used in training programs were satisfactory.	1	2	3	4	5
9. At our school, computer facilities are being used less than what would have been expected a year ago.	1	2	3	4	5
10. Our school has too few computers for students to have sufficient time to learn.	1	2	3	4	5
11. We can't afford the cost of software that would adequately serve our needs.	1	2	3	4	5
12. There are better ways to provide instruction than with the use of computers.	1	2	3	4	5
13. The amount of software available on the METN system is adequate.	1	2	3	4	5

	Strongly Disagree	Disagree	Undecided/ Don't Know	Agree	Strongly Agree
14. The content of the software available on the METN system is appropriate.	1	2	3	4	5
15. Using the system has been valuable to the participating teachers as an instructional tool.	1	2	3	4	5
16. Using the system has been valuable to the participating teachers as an administrative tool.	1	2	3	4	5
17. Only the more able students can benefit from a networking system.	1	2	3	4	5
18. Use of a networking system as an instructional tool will alter the teaching style of many teachers.	1	2	3	4	5
19. In general, as long as my students have access to computers, it doesn't matter if it is with a networking system or stand-alone computers.	1	2	3	4	5
20. It is best if teachers have all their students at the computers working on the same lesson at the same time.	1	2	3	4	5
21. In our school, students usually use the same software packages at the same time.	1	2	3	4	5
22. Students with computers and printers at home have an unfair advantage over other students.	1	2	3	4	5

II. Directions: Mark your answer sheet with the response for each statement that describes how you or your students use word-processing programs.	Never	Rarely	Sometimes	Most of The Time	Always
23. Write an article or research paper.	1	2	3	4	5
24. Make a class product like a book or newspaper.	1	2	3	4	5
25. Planning or administrative use.	1	2	3	4	5

III. Directions: Mark your answer sheet with the response for each statement that describes how you or your students use the following types of software.	Never	Rarely	Sometimes	Most of The Time	Always
26. Preparation of instructional materials.	1	2	3	4	5
27. Drills to help students practice vocabulary or skills.	1	2	3	4	5
28. Games to help students practice words, skills, or concepts.	1	2	3	4	5
29. Programs that EXPLAIN (tutor) concepts or methods.	1	2	3	4	5
30. Simulations for learning or using concepts and skills in a situation.	1	2	3	4	5
31. Programs that give students problem-solving tasks or discovery learning activities.	1	2	3	4	5
32. Programs that let students make pictures, graphics, music.	1	2	3	4	5
33. Programs that do calculations or help solve math problems.	1	2	3	4	5
34. Word-processing software or programs that help with writing.	1	2	3	4	5
35. A programming language, like BASIC, for students to write their own programs.	1	2	3	4	5
36. Programs that provide database searching and research assistance.	1	2	3	4	5

37

IV. Directions: For the following questions, mark your answer sheet with the appropriate letter.

37. What would you estimate is the average system response time to load student materials?

a. less than 1 min. b. 1-3 mins. c. 4-6 mins. d. 7-10 mins. e. more than 10 mins.

38. In the past school year, how many times have you experienced equipment failure?

a. 0-5 b. 6-10 c. 11-15 d. 16-20 e. more than 20

39. On the average, how much time expired before equipment failure problems were resolved?

a. minutes b. hours c. days d. weeks e. months

40. What has been the format of your in-service training?

a. A lecture with small group of 7 or less
b. A lecture with large group of 8 or more
c. Hands on training with a small group of 7 or less
d. Hands on training with a large group of 8 or more
e. Peer tutoring

41. How much time per semester have you spent in formal training?

a. less than a day b. 1-5 day c. 6-10 days d. 11-15 days e. more than 15

42. For how many minutes, on the average, does any one student usually use a given computer program at any one session?

a. 10 b. 20 c. 30 d. 40 e. 50+

43. When was the most recent occasion that some students in your class did computer work during class time?

a. Within the last 3 school days.
b. More than 3 days ago but within the last 2 weeks
c. More than 2 weeks ago but within the last 3 weeks
d. More than 3 weeks ago
e. Never - all computers work is done at other times.

44. Which of the rules for apportioning time do you think is <u>most commonly used by teachers</u> at the school?

a. Equal time for all students in a class.
b. More time for the slower-learning students.
c. More time for students who complete their other work first.
d. More time for students who do not have a computer at home.
e. More time for students who have more interest in computers.

45. How many students work at any one computer at one time?

a. One student per computer, working on his/her own.
b. One student per computer, with a tutor.
c. One student per computer, but with students watching or helping.
d. A pair of students per computer.
e. More than 2 students per computer.

46. Which of the methods for apportioning time do you think is best for use at your school?

a. Equal time for all students in a class.
b. More time for the slower-learning students.
c. More time for students who complete their other work first.
d. More time for students who do not have a computer at home.
e. More time for students who have more interest in computers.

V. Directions: In the following statements, mark your answer sheet with the response (number) to compare the effectiveness of the instructional approach using computers with the traditional approach. Select the more effective one. If neither, select the "Same".	Computer	Traditional	Same
47. Introducing students to the subject.	1	2	3
48. Providing a large variety of examples to illustrate and/or clarify concepts.	1	2	3
49. Covering the material rapidly.	1	2	3
50. Teaching to students of different abilities.	1	2	3
51. Providing remedial assistance.	1	2	3

VI. Directions: Mark your answer sheet with the response (number) that best describes your perception of how the METN computer system has affected instruction and learning at your school.	Decreased	Not Changed	Increased
As a result of computers ...			
52. The apparent level of enthusiasm of computer-using students for school in general has	1	2	3
53. Special opportunities for students with learning disabilities or handicaps have	1	2	3
54. Special opportunities for the academically gifted have	1	2	3
55. Learning in regular school subjects by average students has	1	2	3
56. Learning in regular school subjects by below-average students has	1	2	3

57.	Students working successfully on their own without direct supervision from the teacher has	1	2	3
58.	Students taking the lead in helping other students with their questions has	1	2	3
59.	Students being given assignments specifically tailored to their prior performance has	1	2	3
60.	Diagnoses of students' learning problems and misunderstandings have	1	2	3

57

58

VII. Directions: For the following questions, fill in the blanks on this form.

61. In what areas would you like further training?

a. _____

b. _____

c. _____

62. What do you think is (are) the greatest strength(s) of the METN system?

_____

_____

_____

_____

_____

63. What do you think is (are) the greatest weakness(es) of the METN system?

_____

_____

_____

_____

_____

SITE COORDINATORS QUESTIONNAIRE - METN

I. Directions: Circle the response (number) which best describes how you feel about using METN computer system.	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
1. The METN computer system has been effective in providing instructional support.	1	2	3	4	5
2. The computer system has been effective in providing planning resources for teachers and administrators.	1	2	3	4	5
3. Operationally, the computer system has been reliable.	1	2	3	4	5
4. The technical support given to the computer system is adequate.	1	2	3	4	5
5. In our school, the METN computer system is superior to other computers available for classroom use.	1	2	3	4	5
6. The computer system's hardware is adequate for the programs.	1	2	3	4	5
7. The computer system's storage space is adequate for our instructional needs.	1	2	3	4	5
8. The training provided for teachers and system users has been adequate.	1	2	3	4	5
9. The resources/materials used in training programs were satisfactory.	1	2	3	4	5
10. At our school, computer facilities are being used less than what would have been expected a year ago.	1	2	3	4	5
11. Most teachers at our school do not want to take the time to learn how to use the computer.	1	2	3	4	5

I. Directions: Circle the response (number) which best describes how you feel about using the METN computer system.	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
12. Our school has too few computers for students to have sufficient time to learn.	1	2	3	4	5
13. There is not enough time in the day to fit computers in to our schedule.	1	2	3	4	5
14. We can't afford the cost of software that would adequately serve our needs.	1	2	3	4	5
15. There are better ways to provide instruction than with the use of computers.	1	2	3	4	5
16. The amount of software available on the METN system is adequate.	1	2	3	4	5
17. The content of the software available on the METN system is appropriate	1	2	3	4	5
18. Using the METN/IBM system has been valuable to the participating teachers as an instructional art.	1	2	3	4	5
19. Using the METN/IBM system has been valuable to the participating teachers as an administrative art.	1	2	3	4	5
20. Using of the METN networking system with my students has lightened my work load.	1	2	3	4	5
21. Only the more able students can benefit from a networking system.	1	2	3	4	5
22. Use of a networking system as an instructional tool will alter the teaching style of many teachers.	1	2	3	4	5

I. Directions: Circle the response (number) which best describes how you feel about using the METN computer system.	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
23. In general, as long as my students have access to computers, it doesn't matter if it is with a networking system or stand-alone computers.	1	2	3	4	5
24. It is best if teachers have all their students at the computers working on the same lesson at the same time.	1	2	3	4	5

II. Directions: Using the given response scale, describe the impact of each of the following factors on the effectiveness of the METN System.	No Impact	Little Impact	Not Sure	High Impact	Very High Impact
25. The configuration within the computer center.	1	2	3	4	5
26. The configuration of the system in the school.	1	2	3	4	5
27. The objectives and goals of individual teachers.	1	2	3	4	5
28. The scheduling of students for access.	1	2	3	4	5
29. The quantity of the software available on the system.	1	2	3	4	5
30. The quality of the software available on the system.	1	2	3	4	5
31. Procedures to access materials.	1	2	3	4	5
32. The cooperative approach to learning.	1	2	3	4	5
33. The equality of access to materials.	1	2	3	4	5

III. Directions: Circle one response (number) for each statement that describes how your students use word-processing programs.	Never	Rarely	Sometimes	Most of The Time	Always
34. To write a cooperative essay or research paper.	1	2	3	4	5
35. To make a class product like a book.	1	2	3	4	5
36. To make several issues of a class newspaper.	1	2	3	4	5
37. To write notes to one another that are stored on disk.	1	2	3	4	5

IV. Directions: For the following questions, circle the appropriate letter.

38. What would you estimate is the time required to power-up the system?

a. Less than 1 min. b. 1-3 mins. c. 4-6 mins d. 7-10 mins. e. more than 10 mins.

39. What would you estimate is the average response time to load instructional materials?

a. less than 1 min. b. 1-3 mins. c. 4-6 mins. d. 7-10 mins. e. more than 10 mins.

40. In normal use, how many times have you experienced equipment failure?

a. 0-5 b. 6-10 c. 11-15 d. 16-20 e. more than 20

41. On the average, how much time expired before equipment failure problems were resolved?

a. minutes b. hours c. days d. weeks e. months

VI. **Directions: For the following questions, circle the appropriate letter.**

42. What has been the format of your training?

a. A lecture with small group of 7 or less
b. A lecture with large group of 8 or more
c. Hands on training with a small group of 7 or less
d. Hands on training with a large group of 8 or more
e. Peer tutoring

43. How many hours per semester have you spent conducting formal training?

a. less than a day b. 1-5 day c. 6-10 days d. more than 15

44. Approximately what percentage of your time is dedicated to the METN project

a. 0-20% b. 20-40% c. 40-60% d. 60-80% e. 80-100%

45. Who on the school staff is <u>directly</u> responsible for coordinating or supervising the use of computers by teachers or students?

a. A full-time computer coordinator whose only teaching relates to computers.
b. A full-time regular teacher, who also serves as a computer coordinator.
c. Computers are used by a few teachers who work out their own arrangements.
d. The school librarian or media specialist coordinates computer use.
e. The school principal or another administrator coordinates computer use.

46. Which of the rules for apportioning time do you think is <u>most commonly used by teachers</u> at the school?

a. Equal time for all students in a class.
b. More time for the slower-learning students.
c. More time for students who complete their other work first.
d. More time for students who do not have a computer at home.
e. More time for students who have more interest in computers.

IV. **Directions: For the following questions, circle the appropriate letter.**

47. How many students work at any one computer at one time?

a. One student per computer, working on his/her own.
b. One student per computer, with a tutor.
c. One student per computer, but with students watching or helping.
d. A pair of students per computer.
e. More than 2 students per computer.

48. How many students do you think should work at any one computer at one time?

a. One student per computer, working on his/her own.
b. One student per computer with a tutor.
c. One student per computer, but with students watching or helping.
d. A pair of students per computer.
e. More than 2 students per computer.

49. Which of the methods for apportioning time do you think is best for use at your school?

a. Equal time for all students in a class.
b. More time for the slower-learning students.
c. More time for students who complete their other work first.
d. More time for students who do not have a computer at home.
e. More time for students who have more interest in computers.

V. Directions: In the following statements, compare the effectiveness of the instructional approach by computers with the traditional approach. Select the more effective one. If neither, select the "Same".	Computer	Traditional	Same
50. Introducing students to the subject.	1	2	3
51. Providing a large variety of examples to illustrate and/or clarify concepts.	1	2	3
52. Assessing a student's understanding of a concept.	1	2	3
53. Assessing a student's mastery of a concept.	1	2	3
54. Covering the material rapidly.	1	2	3
55. Teaching to students of different abilities.	1	2	3
56. Providing remedial assistance.	1	2	3

VI. Select the response (number) that best describes your perception of how the METN computer system has affected instruction and learning at your school.	Decreased	Not Changed	Increased
As a result of computers ...			
57. The apparent level of enthusiasm of computer-using students for school in general has	1	2	3
58. Special opportunities for students with learning disabilities or handicaps have	1	2	3
59. Special opportunities for the academically gifted have	1	2	3
60. Learning in regular school subjects by above-average students has	1	2	3

VI. Select the response (number) that best describes your perception of how the METN computer system has affected instruction and learning at your school.	Decreased	Not Changed	Increased
As a result of computers ...			
61. Learning in regular school subjects by average students has	1	2	3
62. Learning in regular school subjects by below-average students has	1	2	3
63. Students working successfully on their own without direct supervision from the teacher has	1	2	3
64. Students taking the lead in helping other students with their questions has	1	2	3
65. Students being given assignments specifically tailored to their prior performance has	1	2	3
66. Diagnoses of students' learning problems and misunderstandings has	1	2	3

VII. **Directions: For the following questions, circle all answers that apply.**

67. What resources have been available to you for the development of training sessions?

a. Outside consultants/vendors
b. MSDE
c. Other METN users
d. Subject specialists
e. Administrators
f. Other (describe):

VII. Directions: For the following questions, circle all answers that apply.

68. What type of staff members have you trained?

a. Teachers
b. Supervisors
c. Administrators
d. Other (describe):_____

69. How did you determine needs to be addressed in staff training sessions?

a. Based on observation
b. Based on needs assessment
c. Suggestion from users
d. Suggestion from subject specialist
e. Other (describe):_____

70. Circle all that you have used since September. Circle 3 that you have used the most.

a.	Drills to help students practice vocabulary or skills	Used Most
b.	Games to help students practice words, skills, or concepts	Used Most
c.	Programs that EXPLAIN (tutor) concepts or methods	Used Most
d.	Simulations for learning or using concepts and skills in a situation	Used Most
e.	Program that give students problem-solving tasks or discovery learning activities	Used Most
f.	Programs that let students make pictures, graphics, music	Used Most
g.	Program that do calculations or help solve math problems	Used Most
h.	Word-processing software or programs that help with writing.	Used Most
i.	A programming language, like BASIC, for students to write their own programs	Used Most
j.	Programs that provide database searching and research assistance	Used Most
k.	Other uses of computers for instructing students	Used Most

VII. Directions: For the following questions, circle all answers that apply.

71. Indicate the approximate percentage of time, students are scheduled for computer-related activities.

	% of time
a. Classes assigned for a full semester or year	_____
b. Complete classes, sent by their teacher, by prior arrangement	_____
c. Groups of students pulled from a class, by prior arrangement	_____
d. Individual students sent by a teacher, by prior arrangement	_____
e. Individual students or groups of students sent without notice	_____
f. Other (describe):_____	_____
	100%

VIII. Directions: For the following questions, fill in the blanks.

72. On the average, how many minutes long is the "turn" for each student (or group of students) at the computer?_____

73. How many staff members do you have?_____

74. How many are trained?_____

75. In what areas would you like further training?
    a._____
    b._____
    c._____

IX. **Directions:** For the following questions, fill in the blanks.

76. What do you think is (are) the greatest strength(s) of the METN system?

_____

_____

_____

_____

_____

77. What do you think is (are) the greatest weakness(es) of the METN system?

_____

_____

_____

_____

_____

YOUR JOB TITLE: _____

STRENGTHS

- 1. Networking.
  2. Available Equipment.
  3. Technical support.
- 4. Stimulates students interest.
- 5. Students move at own rate.
- 6. Integration of use of computers with subject area.
  7. Wordprocessing.

- Teachers listed as a major strength of system in 1987.

WEAKNESSES

- 1. Scheduling.
- 2. Software available.
  3. Load/response time.
  4. Lack of training for teachers.
  5. Not enough time for students to finish assignments.
  6. Maintenance/repairs take too long.

- The majority of the teachers listed this as a major weakness of the METN system.

All of the above were listed as weaknesses in 1987 survey.